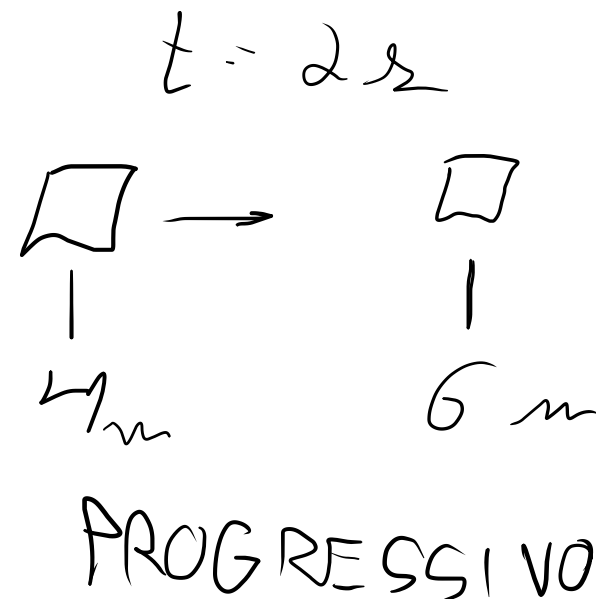


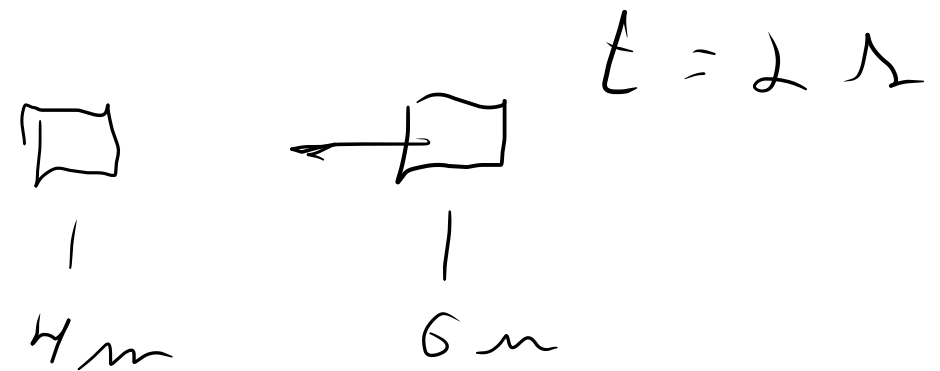
Movimento Progressivo e Retrógado:

$$V_m = \frac{\Delta S}{\Delta t} = \frac{s_f - s_i}{t_f - t_i}$$

$$V_m = \frac{6 - 4}{2} = \frac{2}{2} = 1 \text{ m/s}$$



$$V_m = \frac{4 - 6}{2} = \frac{-2}{2} = -1 \text{ m/s}$$



RETRÓGRADO

Movimento Uniforme:



$$V = \text{CONSTANTE}$$

$$S = S_0 + vt$$

$$V_m = \frac{\Delta S}{\Delta t} = \frac{S_f - S_i}{t_f - t_i}$$

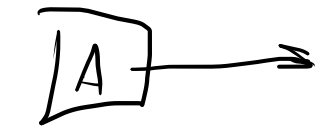
$$V_m(t_f - t_i) = S_f - S_i$$

$$V_m t_f - V_m t_i = S_f - S_i$$

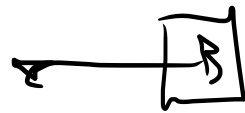
$$V_m t_f = S_f - S_i$$

$$S_f - S_i = V t$$

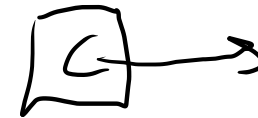
Velocidade Relativa:



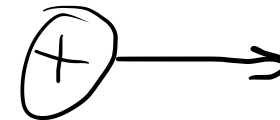
$$V_A = 60 \text{ km/h}$$



$$V_B = -60 \text{ km/h}$$



$$V_C = 60 \text{ km/h}$$



Em sentidos opostos:

$$V_{AB} = |V_A| + |V_B|$$

Mesmo sentido:

$$V_{AC} = |V_A| - |V_C|, \text{ se } |V_A| \geq |V_C|$$

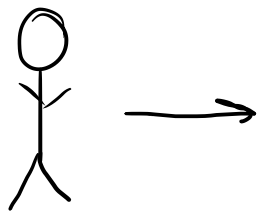
Aceleração:

$$a_m = \frac{\Delta V}{\Delta t} = \frac{V_f - V_i}{t_f - t_i}$$

$$\frac{\frac{m}{s}}{\frac{s}{1}} = \frac{m}{s} \cdot \frac{1}{s} = m/s^2$$

①

$$t = 0 \text{ s}$$



$$V = 0 \text{ m/s}$$

$$t = 2 \text{ s}$$



$$V = 6 \text{ m/s}$$

$$a_m = \frac{6 - 0}{2 - 0} = \frac{6}{2} = 3 \text{ m/s}^2$$

②

$$t = 4 \text{ s}$$



$$V = 0 \text{ m/s}$$



$$a_m = \frac{0 - 6}{4 - 2} = \frac{-6}{2} = -3 \text{ m/s}^2$$

Movimento Retardado e Acelerado:

① ACELERADO

$v > 0, a_m > 0$ MESMO

$v < 0, a_m < 0$ SINAL!

② RETARDADO

$v > 0, a_m < 0$ SINAL

$v < 0, a_m > 0$ OPÓSTO!

Movimento Uniformemente Variado:

$$a = \text{CONSTANTE}$$

$$a_m = \frac{\Delta V}{\Delta t} = \frac{V_f - V_i}{t_f - t_i}$$

$$a_m(t_f - t_i) = V_f - V_i$$

$$V = V_0 + at$$

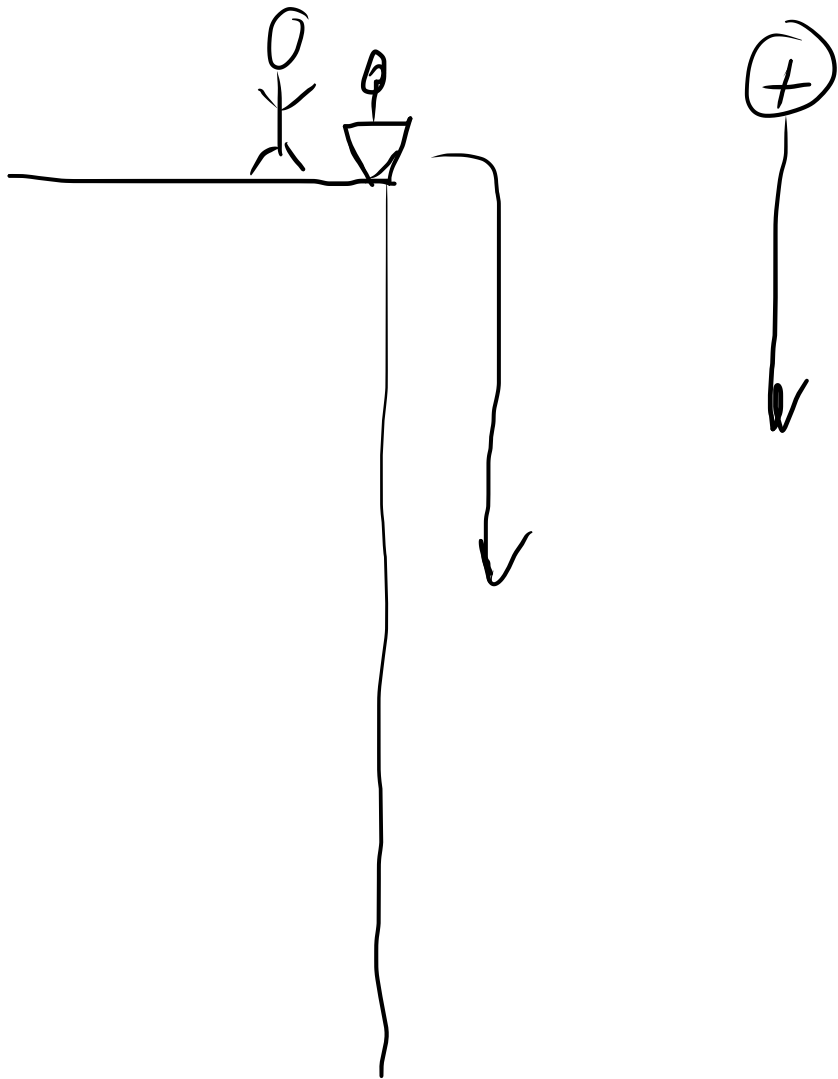
$$a_m t_f - a_m t_i = V_f - V_i$$

$$a t_f = V_f - V_i$$

$$V = 0 + 10 \cdot 1,09$$

$$V = 10,9 \text{ m/s}$$

Movimento Uniformemente Variado:



$$S = S_0 + v_0 t + \frac{a t^2}{2}$$

$$a = 9,8 \text{ m/s}^2 \approx 10 \text{ m/s}^2$$

$$6 = 0 + 0t + \frac{10 t^2}{2}$$

$$6 = \frac{10 t^2}{2} = 5 t^2$$

$$\frac{6}{5} = t^2 \Rightarrow t = \pm \sqrt{\frac{6}{5}} = 1,09 \text{ s}$$

Movimento Uniformemente Variado:

$$V = V_0 + at$$

$$V^2 = V_0^2 + 2atV_0 + a^2t^2$$

$$V^2 = V_0^2 + 2a\left(V_0t + \frac{at^2}{2}\right)$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$a^2 = a \cdot a$$

$$\Delta s = s - s_0 = V_0t + \frac{at^2}{2}$$

$$V^2 = V_0^2 + 2a\Delta s$$